APQ-56 Improvement Program

3/27/57

SYSTEM

All 1.13 Resolution Problem - [redacted] STAT

Presently, the resolution of the recorder is not equal to that of a 0.1 us transmitting and receiving system. In the search for a CRT that will equalize them, the literature on the subject is being searched and discussions have been started with DuMont, G. E. and W Research.

XH-2 XH-3 NAVY 2.13 Recorder Cooling - [redacted] STAT

Trial installation of blowers on one XH-2 recorder was completed on 25 March. Cooling data with this type blower installation is not yet available. A new design for the camera cover to allow ram air, presently available in area of camera, to cool the camera has been drawn up and will be released to the Model Shop this week. It is planned that as soon as the trial installation proves satisfactory then a modification kit will be officially released to correct all units. Sufficient parts necessary to accomplish the modification are on order and the Model Shop is fabricating all other parts required.

XH-2 XH-3 NAVY 4.7 R. F. High Voltage Power Supply - [redacted] STAT

The 10 KV capacitors have arrived and have been coated with silastic rubber to protect the capacitors (glass encased) from breakage during any thermal cycling tests or operating conditions.

At the writing of the last report, the first potted unit using the Spellman coil had just been taken from the mold, checked, and found to be unsatisfactory. The cause for the unsatisfactory results was blamed on the construction of the coil, (i. e. the Spellman coil is untreated; consequently, the addition of the potting compound around the windings caused a larger than normal change of distributed capacity which can cause sufficient mistuning to effect the performance of the coil). However, the potted unit was disassembled to double check any other possible causes for electrical losses. Another cause was found that actually had much more effect than the above factor. The pressure contact of the ground and high voltage connectors to the high voltage filter capacitor was inadequate. The contact through the solder lug and capacitor's steel stud was inadequate; consequently, future units will be soldered directly to the capacitor plus a pressure contact.

The second unit which had the Westinghouse coil was also found faulty. The cause for unsatisfactory performance was that the filament coil had melted causing the center conductor to shift to the edge of the insulation and short out to one of the primary winding terminals. The reason for the above is that the exothermic temperature of the potting material used in the mass involved beams high enough to melt the insulation on the filament lead; the filament lead insulation contains styrene which has a relatively low melting temperature (180° F). Future units will have teflon insulated filament leads.

SYSTEM

R. F. High Voltage Power Supply (Cont'd)

The third potted unit which had been potted prior to the discovery of the cause of the filament lead shorting trouble, also exhibited the shorted filament; however, this Spellman coil had been treated priot to potting and an inprovement in performance was recorded over the first untreated coil.

Starting March 27 three units will be potted every other day until the required number of 8 units are obtained. At this rate all 8 units should be ready for shipment on the 5th of April.

All 6.13 P. E. Cell - [redacted] STAT

Three P. E. Cell Test Sets are being built and tested to establish the sensitivity of P. E. Cells. All sets have been completed. The first attempt to correlate between sets with various bulbs is ± 12%. It appears that the correlation can be increased by adding neutral density filters to the sets giving the largest variation in results. One set has been painted dull black giving a 25% reduction in motor temperature. The other two sets are now being prepared for painting.

All 11.13 Quick Disconnect Waveguide - [redacted] STAT

Parts are now on hand to permit modification of all Time-Shared equipments. This change will be included in the Mod Kit to incorporate maggie and klystron fins since the simultaneous drawing hangers are involved. These drawings are now being checked in Drafting. (Same as last report).

All 12.13 Pulse Cable Connectors - [redacted] STAT

Five sets of pulse cable connectors of a new design have been received. Their adaptability to APQ-56 system has not yet been determined. (Same as last report).

Time Shared 13.13 AGC - [redacted] STAT

Design a new AGC for less susceptibility to r-f pick-up and interference. Work is continuing on the excessive pick-up present when the new AGC is put into one recorder. Drafting is incorporating the recent circuit changes in their drawings of the new AGC.

All 14.10 Trigger Circuit Redesign (Overload at turn-on) - [redacted] STAT

Tests performed on the modified circuit showed that it should remedy the overload problem. The fix is in the process of being written-up and incorporated into field mod. kits.

No further report will be made on this problem.

SYSTEM

All 15.12 Maggie Stem Pressure Seal - [redacted] STAT

Parts and materials for Modification Kit #11 have been ordered. The modification instructions and necessary change orders have been written. This improvement is considered completed.

Time Shared 17.9 Wide Band Receiver - [redacted] STAT

The pre amp., post amp. and video amp. are mechanically completed, bench tested and are now in a system being checked out.

All 19.9 Receiver Design - [redacted] STAT

Electrical and mechanical data on the type 5718 triode was received from the manufacturer. From the use of this information a suitable input network was designed. A two-pole input network is presently being used but it is felt that if the required bandwidth of the receiver gets much larger a three-pole network will probably be used.

Since the overshoot requirement of this receiver was not definitely specified, some thought is being given to the determination of this requirement.

All 20.7 Pulse Width - [redacted] STAT

The hand tube modulator is now ready for testing of the 6799 magnetron. Investigation will be made of the effects of rise and fall times on the magnetron spectrum and R.F. envelope.

All 21.8 Pulse Width (Quick Fix) - [redacted] STAT

All parts for modification of three units have been received. One set of parts has been shipped to field for a trial run in one side of XH-3 system. No reports from field have been received to date.

All 22.5 Resolution Test Set - [redacted] STAT

A means for measuring recorder resolution is needed in the field. Eight Resolution Test Sets will be built for the Time Shared System by S. R. using commercial type construction. Two cabinets have been received. Construction is starting.

XH-2 XH-3 NAVY 23.2 2 KV Distribution - [redacted] STAT

A purchased part drawing for a 2 KV power supply with floating grounds has been made and should be confirmed with AMP this week. The use of this supply will eliminate all exposed high-voltage points in the recorder.

Drawings are being made of a transformer and a molded voltage quadrupler which will be added to the monitor scope by change order. The monitor scope will then have its own 2 KV supply and the high voltage cable between the recorder and monitor scope will be eliminated. (Same as last report).

MOD KIT STATUS AS OF 3/26/57

(Serial Nos. for Time Shared Unless Otherwise Noted)

Reference No.	System	Kit No.	Description	Serial Nos.	Remarks
2.11.1	T/S	1.0	Recorder Cooler	06, 7, 8, 9	04, 05 to E&S 3/13
		1.1	" "	03, 05	Parts for 1st 6 units being procured;
		1.2	" "	01, 02, 04	Approx. Shipping Date week of 3/25.
		1.3	" "	12	Parts for 07 thru 13--no promise
		1.4	" "	10, 11	from Shop.
		1.5	" "	13	
2.11.2	T/S	1.1	Recorder Cooler	04, 05	Shipped
		1.2			
2.11.3	T/S	2.0	Camera Cooling	07 thru 17	Covers must be modified--need info. from Engineer
		2.1		01, 02, 04, 05	Ready to Ship
		2.2		03	" " "
		2.3		06	" " "
5.9C	T/S	3.0	Camera Servo Motors	02, 03, 06	Ready to Ship
		3.1	" " "	01, 04, 05	" " "
	XH-2	3.2	(DYD-40037) "	01, 02, 03	" " "
	NAVY	3.2	(DYD-40065) "	01	" " "
5.9D	T/S	4	Focus & Alignment		Procuring items Specialties Items Rec'd.
	XH-2		Fixture		
3.9	T/S	5	Recorder 10 KV Power Supply AMP Pack	01 thru 14	Waiting for AMP Packs--6 Driver Assys available. Shop progress on balance not available
	T/S	6	Power Supply Fuse Protection for 28 V	01 thru 09	Procuring items for shipping
	T/S	7	Focus Alignment Fix.	01 thru 06	Waiting for reticle on P.O. 11554
			Provide for rear Antenna Feed	07 thru 17	Prom. W/S 4/2/57
	NAVY		DYD-40065	01	
	T/S	8.0	Control Panel to Prevent Synchro damage	07 thru 12	Ready for Shipment
		8.1		01 thru 06	" " "
	T/S	9	Synchronizer - Replace Clutch in Alt. Serva	01 thru 12	Procuring Prints and Material
	XH-2		" (DYD-40037)	01-02-03	
	XH-3		" (DYD-40056)	01-02	
1.11	T/S	10	Power Supply - Decrease 400 V Ripple	01 thru 13	Shipped
15.10	All	11	Maggie Seal	All	Not rec'd from Engr. - Some parts on order. 4 to 5 weeks delivery

Reference No.	System	Kit No.	Description	Serial Nos.	Remarks
15.10	T/S	12	Ant. System	01	Waiting on Parts
			Adjust Angle of Rod	01, 02	" " "
	XH-2	13	Ground Range Sweep	01, 02, 03	Procuring Material & Parts
	XH-3 T/S	13.1	Add Clamping Circuit	01, 02 07 thru 14	
		14	Cabling		Not released by Engineer
		15	AGC Clamp Video Amp	?	Not released by Engineer